

IN THE DRAWINGS:

A replacement sheet has been attached to this amendment providing the indication of angle β in Figures 6(c-e). The addition of this indication of an angle does not add any new matter to the application, but merely provides graphic assistance in understanding the angles of structure already provided and shown in the figures.

REMARKS

This amendment is being filed in response to the Office Action dated February 24, 2005. For the following reasons, this application should be considered in condition for allowance and the case passed to issue.

The drawings were objected to under 37 C.F.R. 1.83(a) as failing to show angle β in Figures 6(c-e) as described in the specification on page 14, lines 13-15. This objection has been obviated by the provision of a replacement sheet correcting the informality in the drawing as noted by the Examiner. No new matter has been added to the application by this change.

The allowance of claims 1-10 and 19-50, as well as the indication of allowability of claims 16-18 is gratefully acknowledged. In consideration of the arguments presented below, claims 16-18 have not been rewritten in independent form at this time to include all limitations of the base claim and any intervening claims.

Claims 11-15 and 51 were rejected under 35 USC §102(b) as being anticipated by Arbeus. This rejection is hereby traversed and reconsideration and withdrawal thereof are respectfully requested. The following is a comparison of the present invention as claimed with the Arbeus reference.

As provided in claim 11, the present invention relates to a centrifugal pump impeller, comprising at least one vane disposed on the impeller, and a flange forming at least a portion of a working surface of the vane at an impeller to wear plate interface and extending toward a high-pressure side of the vane. Claim 51 provides a centrifugal pump impeller comprising at least one vane disposed on the impeller. The vane comprises a curvilinear and continuous vane extending from one edge of the centrifugal pump impeller through a central portion of the impeller to another opposing edge of the impeller. The leading edge of the curvilinear and continuous vane has, at least

in the vicinity of the central portion of the impeller, a substantially constant thickness. The vane is symmetric and a height of the leading edge relative to a bottom of the impeller increases continuously from an outer radius of the leading edge to the central portion of the impeller.

In order to anticipate claims in a patent application under 35 USC §102, a single prior art reference must identically disclose each and every element of the claimed invention. Without such identical disclosure, there can be no anticipation. It is respectfully submitted that the rejection based on Arbeus as anticipating claims 11-15 and 51 does not meet this exacting burden.

Arbeus, U.S. Patent No. 6,158,959, relates to a pump impeller having a vane 5 with leading edges 6 that are strongly swept backwards. Reference numeral 8 refers to a periphery, as seen in top view in figure 3. The Examiner stated that reference 8 refers to a flange and is formed in the leading edge of the impeller. However, it is apparent from the figures of Arbeus that a flange is not provided. There is no projecting collar, rim, or rib on the object, as one of ordinary skill would understand the meaning of the term flange. See, for example, the view of the flange 130 in Figure 3(c) and Figures 6(c-e) of the present application. By contrast, there does appear to be any projection shown in any of the figures 1-4 in Arbeus. Instead, the vane 5 appears to start with an initial thickness at a vane leading edge 8 and become thinner as it reaches a central hub.

With respect to claim 11, therefore, Arbeus cannot be said to disclose a flange forming at least a portion of a working surface of the vane at an impeller to wear plate interface, nor a flange that extends toward a high-pressure side of the vane. Claim 11 cannot be considered to be anticipated by Arbeus, and therefore the rejection of claim 11 under 35 USC 102(b) should be reconsidered and withdrawn. Claims 12-15 further depend from and limit claim 11 and should therefore also be considered allowable. However, independent reasons provided below compel withdrawal of the rejection of these claims.

Claim 12 of the invention requires the vane to comprise a curvilinear and continuous vane extending from one edge of the centrifugal pump impeller through a central portion of the impeller to another opposing edge of the impeller. Arbeus, by contrast, does not have a continuous vane extending from one edge of the centrifugal pump impeller through a central portion of the impeller to another opposing edge of the impeller. Instead, the vane is broken up by a central hub 4. There is therefore a lack of identical disclosure of the claimed vane of claim 12.

Claim 13 requires a leading edge of the curvilinear and continuous vane having, at least in a vicinity of a midpoint of the impeller, a substantially constant thickness. As depicted in Figure 1, Arbeus shows a vane that reduces in thickness from the leading edge to the midpoint of the impeller. Therefore, it does not exhibit a substantially constant thickness, as required by the claims of the invention. Figure 1 shows a vane that narrows as it extends from the leading edge towards the hub. Therefore, claim 13 cannot be said to be identically disclosed by the Arbeus reference.

Claim 14 further depends from and limits claim 13 and therefore should also be considered allowable over the Arbeus reference. Similarly, claim 15 also depends from and further limits claim 13 and should be considered allowable for at least the reasons provided with respect to claim 13.

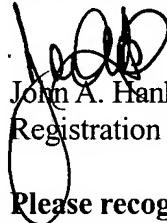
With respect to claim 51, the claim requires a vane that comprises a curvilinear and continuous vane extending from one edge of the centrifugal pump impeller through a central portion of the impeller to another opposing edge of the impeller. As discussed above with respect to claim 12, Arbeus fails to identically disclose this feature. Further, Arbeus also fails to disclose, as required in claim 51, a leading edge of the vane having a substantial thickness at least in the vicinity of the central portion of the impeller. For at least these reasons, claim 51 is not anticipated by the Arbeus reference.

In light of the amendments and remarks above, this application should be considered in condition for allowance and the case passed to issue. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 502624 and please credit any excess fees to such deposit account.

Respectfully submitted,

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